Vehicle Variants of Crew Served Weapons

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AGENDA

- Requirements
- Trends
- Current/Future Vehicle Platforms
- Crew Served Family
- Specifications
- Logistic Footprint
- Conclusion

Secondary Armament
General Vehicle Requirements

- Lethality
  - ➢ Hit what you aim at and maximize the effect
- Lightweight
  - ➢ Increased emphasis on lightweight vehicles for rapid deployment
- Reduced Logistic Footprint
  - ➢ Reduce supply chain
  - ➢ Increase fieldability
- Reduce Collateral Damage
  - ➢ Hit only what you aim at

Target Requirements

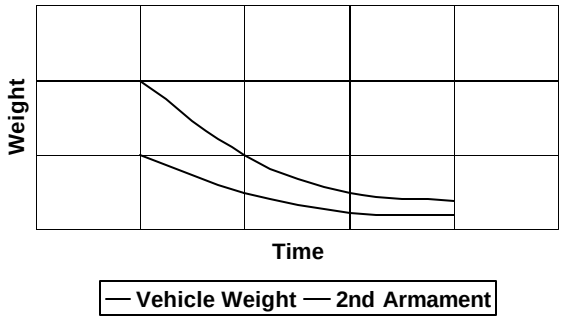
- Standing Troops
- Prone Troops
- Prone Deflated Troops
- Light Armored Vehicles
- Airborne Threats

Operational Requirements

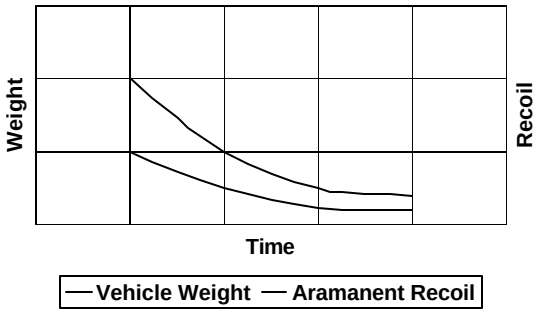
- Independent Fire Control
- Reliability
- Maintainability
- Life Cycle Cost
- Maximum Range
- Time of Flight
- Environmental Robustness
- Dismountable for Fixed Deployment or Infantry Offensive

Trends in Vehicle Applications

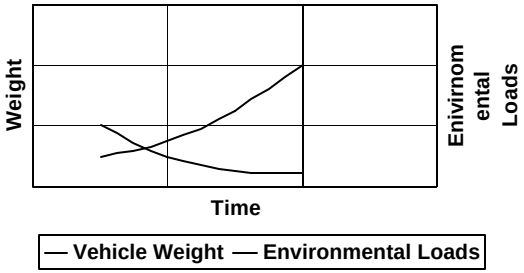
Weight Trends



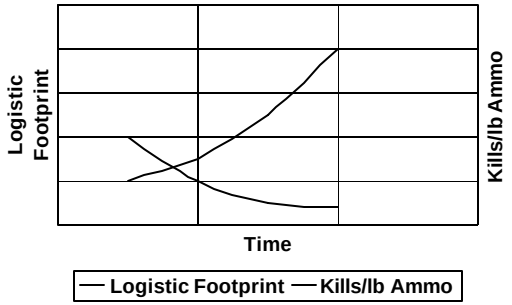
Weight and Recoil Trends



Weight and Environmental Loading Trends



Logistic Footprint & Kills/lb Ammo



Application of Crew-Served Armaments on Current and Future Ground Vehicles

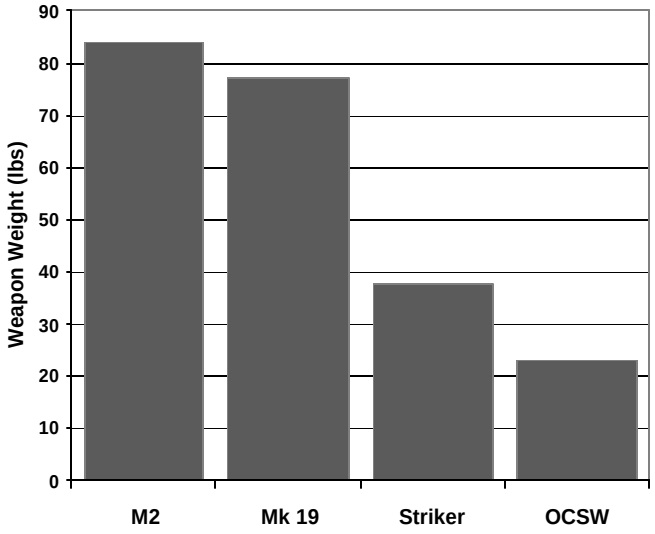
- Legacy Weapons
  - M2 .50 cal
  - Mk19 40mm
  - M240 7.62mm
  - M60 7.62mm
- Current Vehicle Applications
  - HMMWV
  - Abrams Tank
  - Paladin Howitzer (M109A6)
  - Bradley Fighting Vehicle
  - M88A1 Tank Recovery Vehicle
  - M113 Armored Personnel Carrier
  - M109 Howitzer
  - M992 FAASV
  - Light Assault Vehicle (LAV-25)
  - Armored Security Vehicle

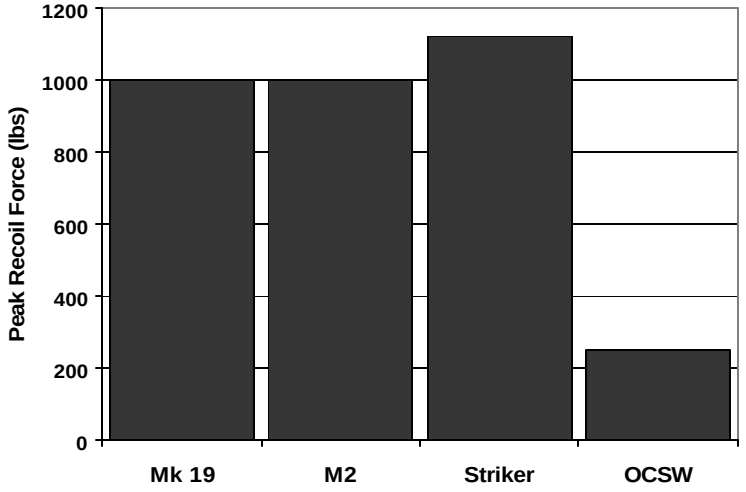
- Future Weapon
  - Systems
  - GAU-19
  - Mk47 Mod 0
  - OCSW
- Future Vehicle Applications
  - Light Infantry
  - Brigade Combat Team (BCT) Select Vehicle Variants
  - Crusader
  - FCS
  - FCS Robotic System Armament
  - Bradley Fighting Vehicle
  - New Support Weapon (NSW)
  - Multi-Role Armored Vehicle (MRAV)
  - Scout/TRACER

Crew Served Weapons

GDAS Offers a Complete Range of Crew Served Weapon Solutions:

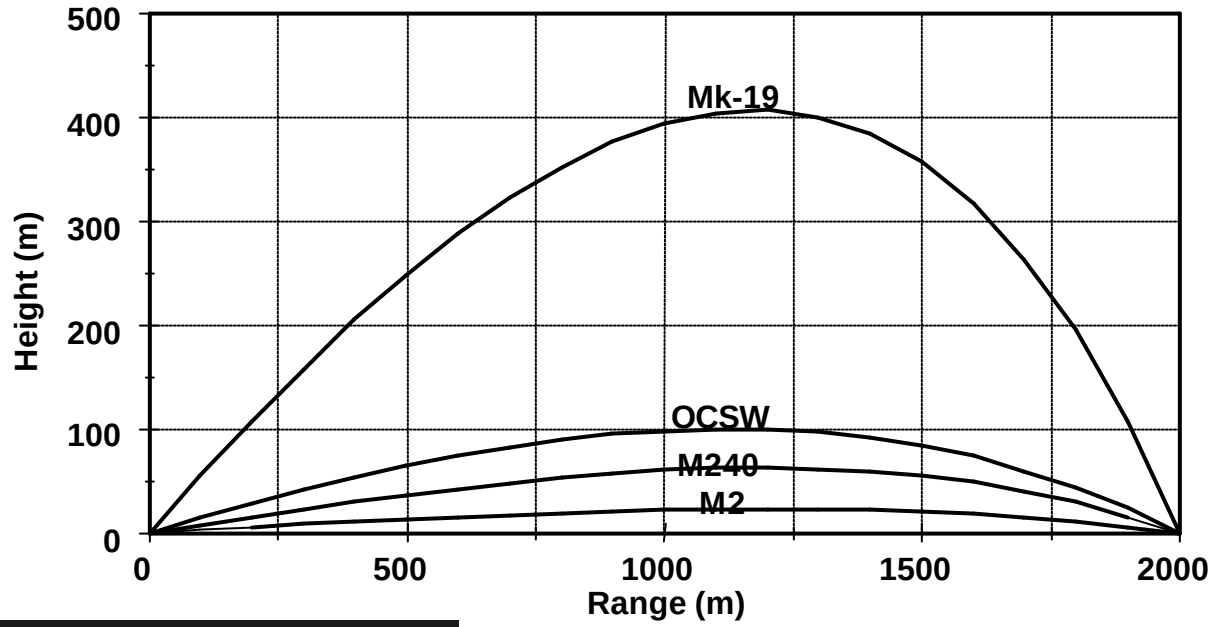
OCSW Recoil & Weight Comparison





Trends: Weapon Design Advancement is Lowering Weight & Recoil

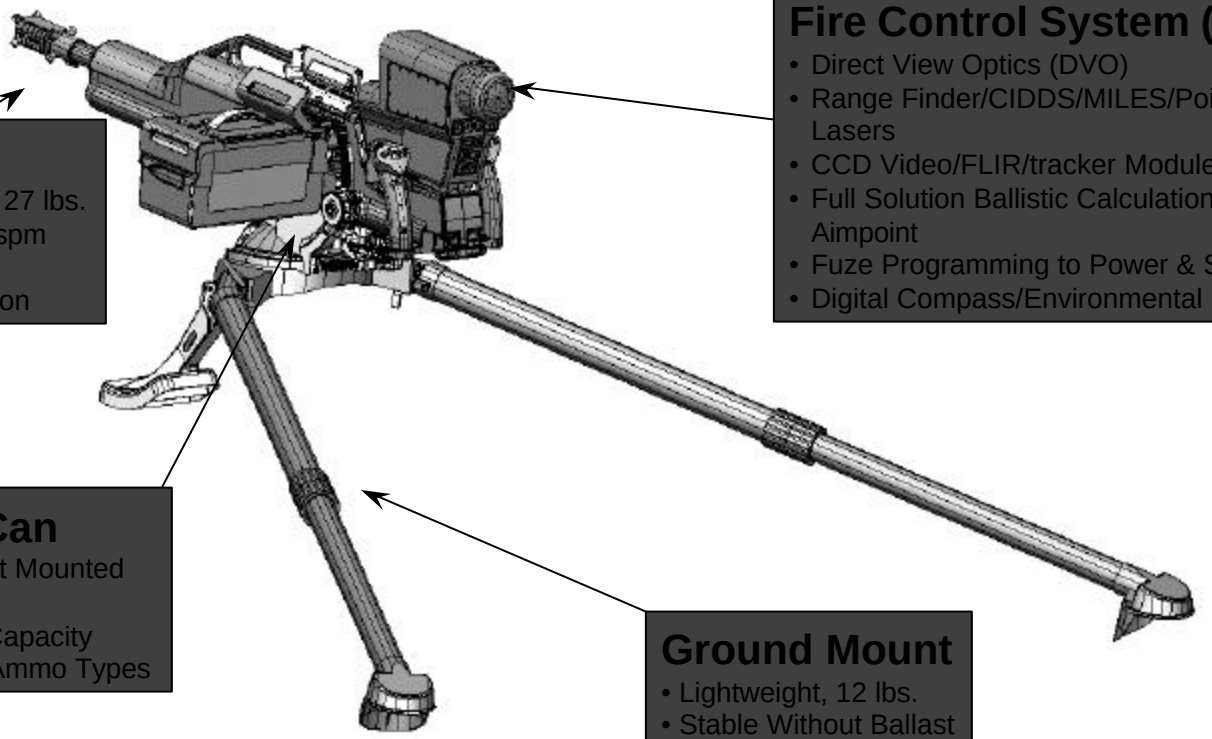
Ammunition Trajectory Comparisons



OCSW Provides the User with Increased Stand-Off Lethality and Reduced Engagement Time

TOF (sec)	500m	1000m	1500m	2000m
OCSW	1.55	3.55	5.97	8.89
M2	0.62	1.47	2.65	4.24
Mk-19	2.78	6.49	11.39	17.99
M240	0.77	2.19	4.18	6.68

OCSW System



Weapon
- Lightweight, 27 lbs.
- 25mm, 220 spm
- Soft Recoil
- Gas Operation

Fire Control System (FCS)
- Direct View Optics (DVO)
- Range Finder/CIDDS/MILES/Pointing Lasers
- CCD Video/FLIR/tracker Module
- Full Solution Ballistic Calculation/reticle Aimpoint
- Fuze Programming to Power & Set Fuze
- Digital Compass/Environmental Sensors

Ammo Can
- Right or Left Mounted
- Linked Belt
- 31 Round Capacity
- All OCSW Ammo Types

Ground Mount
- Lightweight, 12 lbs.
- Stable Without Ballast
- Height Adjustable

System Comparison

System	40mm Mk-19 Mod3	Cal .50 M2HB	7.62mm M240	40mm Mk47 Mod 0	25mm OCSW
Weapon Weight (lb)	75.6	84.0	24.2	38.0	27.0
Mount Weight (lb)	65.4	46.1	19.2	36.7	12.0
Fire Control (lb)	N/A	N/A	N/A	16.5	7.0
Unloaded System Weight (lb)	141.0	130.1	43.4	80.0	46.0
Ammunition Weight (lb / Round)	1.2	.4	.1	1.2	.5
Relative Lethality (lbs Ammo / Kill)	37.0	39.0	8.0	20.0	1.0

A Lightweight System with Airburst Munitions and Fire Control is Key to Reduced Logistic Footprint

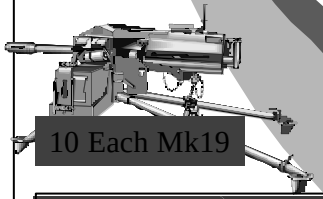
Increase Lethality Payoff
Anti-Personnel Role

(Typical Marine Infantry Battalion)

30 Day Supply (Rds)	
M8	21,060
M430	13,740
M80	60,720
Total	95,520

Ammo Cube (Volume)	
M8	111
M430	309
M80	105
Total	525 cu.ft.

23 Each M240



10 Each Mk19

6 Each M2

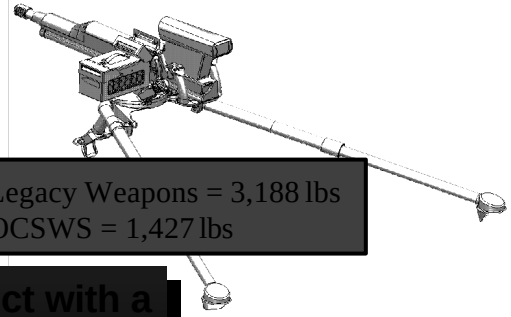
OCSW Comparisons

Rounds	3,170	97% less
Ammo Cube	54	90% less
Ammo Weight	1,429	95% less
Ammo Cost	$69,428	76% less

Ammo Weight	
M8	8,098
M430	17,032
M80	6,264
Total	31,394 lb.

Ammo Cost	
M8	$ 42,120
M430	219,840
M80	33,396
Total	$295,356

Toward the Future



39 Legacy Weapons = 3,188 lbs
39 OCSWS = 1,427 lbs

Substantially Less Weight & Volume to Get to the Conflict with a Significant Improvement in Cost Effectiveness

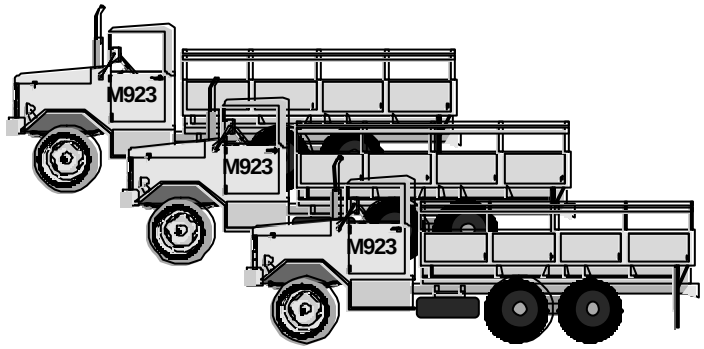
Logistic Footprint

Used In ADPA1998

(Typical Marine Infantry Battalion)

3 Truckloads (5-Ton) / 3 Drivers

- Logistics
  - ➢ Conventional Ammo
    - Weight = 31,394 lbs.
    - 9.6 Pallets / 700 Boxes
    - Avg. Box Wt. = 45 lbs.
    - Ammo Cost = $295,356
  - ➢ Equivalent OCSW Ammo
    - Weight = 1,431 lbs.
    - 1.2 Pallets / 103 Boxes
    - Avg. Box Wt. = 14 lbs.
    - Ammo Cost = $69,428



1 Truckload / 1 Driver

HMMWV

Future Systems like OCSW Allow Significant Reductions in Logistic Support and Equipment

Pintle Mount Demonstration on HMMWV

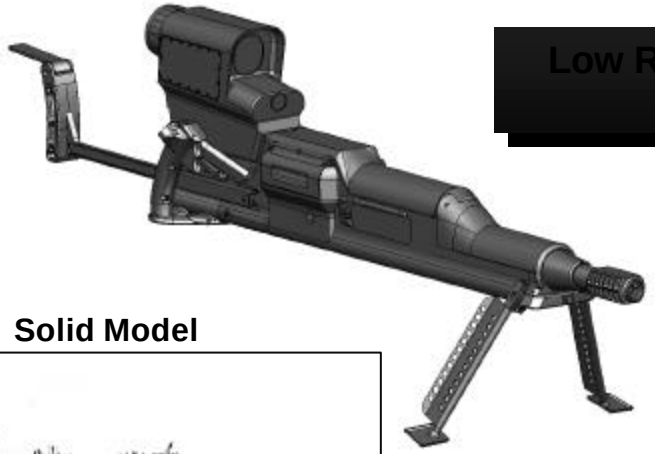
HMMWV Firings, June 1999

Easily Mounted OCSW has High Potential for Widespread Use as Primary / Secondary Armament on Land, Sea and Air Vehicles

OCSW Mockup on Kollmorgen Stabilized Mount Installed on HMMWV

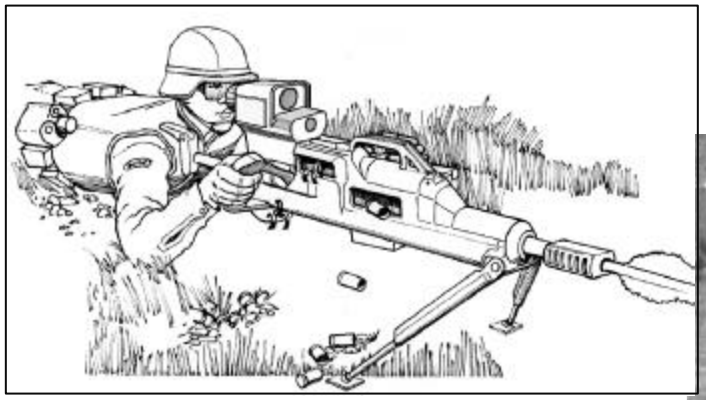
OCSW Installed on an M113 Fire Tested July 15, 2000

Bipod Firing Demonstration



Low Recoil Loads are Compatible with Bipod Firing.

Solid Model



Bipod Firings, June 1999

Conclusion

- Trends in vehicle weight, logistic footprint, and collateral damage reduction drive secondary armament technology.
- Legacy systems are well developed and readily deployable but do not meet the needs of the future.
- With Striker and OCSW, GDAS is providing weapon systems to meet the future needs.